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Two major approaches to the analysis of the organizational structure of schools are described. The rational approach focuses on characteristics that are bureaucratic and relate to the hierarchical exercise of authority. The natural-system approach focuses on the social structure and attempts to identify the power structure through analyses of interaction, communication, and reliance patterns. A number of studies are reviewed to help clarify basic concepts of the two approaches and determine sources of influence upon the behavior of teachers. Subjects covered in the review include characteristics of influentials, the identification of subgroups for the general communication structure and the informal socializing structure, characteristics of subgroup members, the relationship between influence structure and innovation, bureaucracy as a unitary or multidimensional concept, and dimensions of authority and expertise. To meet the demands of current and future educational practices, organizational structures must be designed that are based upon these and other conceptualizations of particular relevance to schools and school systems. (JK)

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ORGANIZATIONAL STRUCTURE AND TEACHER BEHAVIOR

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The central educational processes, teaching and learning, take place almost in entirety within an organizational setting. Those who tend to view "organization" generally, and educational organizations more specifically, as a great evil naturally consider this fact of life to be regrettable, if not intolerable. Others, who tend to view the formal structure as the source of all those things essential to the central processes, take a much more kindly attitude toward the organization. Needless to say, this group probably includes the large majority of those who are tied to school systems in administrative and supervisory capacities. This kindly view is supported by sources in the literature which equate the tasks and functions of administrative personnel with all that is good in the organizational life of schools: the improvement of teaching and learning, the enhancement of the everyday life of organization members, and the attainment of complex goals.

Under more critical analysis, the assumption that all of the activities of administrators and that all of the demands which the organization makes of its members result in positive and unequivocal contributions to the central processes of teaching and learning, has given way to more open questioning. Many researchers and practitioners are still willing to accept the assumption that the characteristics of the school and school system organization -- both formal and informal, planned and unplanned, deliberate or accidental -- do have an impact on the work of pupils, teachers, and administrators; however, questions now are being asked about the nature and the extent of this impact.[1]

To what extent are people in the organization influenced by some of the enduring patterns which are part of or are created by the organization? What organizational patterns have what particular effects? How might the structure of the organization be modified to reduce or eliminate the sources of undesirable effects? These are just a few of the questions which are implicit in some of the recent research into the organizational structure of schools and of school systems.

As always, the search for answers to these questions is hindered by a host of conceptual, methodological, logical, and operational difficulties. These difficulties are related to identifying an appropriate model for use in the study of schools and school systems, selecting a suitable operational definition of structure, identifying significant variables which might be interrelated, framing suitable hypotheses, solving problems of research methodology, and then using the results in some way which will improve the environment in which teachers and pupils work. This paper is directed toward describing two major approaches to the analysis of the organizational structure of schools and to reporting the results of a limited number of recent research efforts which have used these approaches.

Conceptual Bases

Organizational structure, as it relates to schools and school systems, refers to the characteristics of the enduring, more or less permanent, patterns of the operation of these organizations. The concern with structure reflects a concern for the way in which the various members and units of the organization relate to each other, with the distribution

and location of power and influence, with the way in which the many activities of the organization are controlled, and with the manner in which activities are limited and courses of action are selected. To say that a school faculty is dominated by the principal, or that great emphasis is placed upon the autonomy of individual teachers, or that senior faculty members are influential in decision making, or that communication and interaction are severely restricted is to say something about the structure of the school as an organization. The various studies which focus on organizational structure all refer in some way or other to these persistent and characteristic patterns of organizational reality even though they vary in specific operational definitions and in the underlying conceptual bases.

Gouldner has suggested that the main conceptual and methodological approaches in the analysis of organizations tend to take as points of departure either a rational or a natural-system model.[2] The research which is described in this paper includes studies of structure which relate to both of these models. One set of studies focuses more on the so-called rational aspects of structure; that is, on those characteristics that have come to be termed bureaucratic in the technical sense after the usage of Weber and other.[3] In this research attention is given to the hierarchical exercise of authority, the presence of rules and clearly-limited role definitions, reliance upon specialization, and other elements which are commonly considered to be characteristics of bureaucratic structure. The other set of studies approaches the analysis of structure more from a natural system perspective; the object of interest is the social structure rather than the formal structure of the organization. Attention is focused

on the analysis of interaction, communication, and reliance patterns in an attempt to identify centers of power and influence.[4]

These two distinct approaches together provide a fairly complete coverage of the possible structural sources of influence on the attitudes and behaviors of members of the organization, even though the link between the two remains vague. The sections which follow include detailed descriptions of the analysis of social structures and of bureaucratic structure in schools in that order.

Analysis of Influence Structures

The analysis of the social and influence structures in schools requires few, if any, assumptions and information about the formal positions and role relationships which are present; indeed, very little need be known about these factors other than the information required for deciding upon procedures for data collection. This area of research seeks to identify various facets of the influence structure, to isolate influential persons within the structure, and to assess the impact of this structure upon the behavior of members of the organization.[5] The basic techniques for the study of influence structures are firmly grounded in the procedures which have been developed for the sociometric study of groups. Questions of a sociometric type, such as those which follow, are developed according to the purpose of the research and are used to solicit data on communication and interaction patterns:

1. During the course of a typical school week, in school or out of school, with which individuals are you likely to discuss general school matters (teaching duties, school events, school policies, school program, students, etc.)? (General Task Communication)

2. With which individuals are you most likely to socialize informally during recesses, during noon hours, before and after school? (Informal Socializing)

3. If you had a problem concerning discipline (or other specified areas) in your classroom, from whom would you likely seek advice? (Reliance)

4. In your opinion, which individuals in this school are most influential in initiating changes in general school practices such as testing programs, school regulations, school activities, and so forth? (Attributed Influence)

Questions such as these yield information about four different aspects of the social and influence structures in a school; general task related communication, informal socializing, reliance, and attributed influence. From this information, influentials on various dimensions and subgroup membership may be determined through subsequent analysis. It is important to bear in mind that the unit of analysis is the school and that in order to be able to carry out the analysis, it is necessary to have responses to these sociometric questions from all of the individuals whose communications and interactions may have a bearing on the study. Usually this will include teachers, administrators and supportive staff such as those located in clerical, counseling, and library services.

Sociometric Techniques

In general, the basic procedures which have been developed for the analysis of sociometrices are used in the compilation and the reduction of data to manageable and meaningful form.[6] Responses from individual members of a school staff are used to construct an interaction or communication matrix

in which entries of ones and zeroes indicate whether or not a communication or interaction link exists between two specific individuals. The initial, first power matrix includes all of the primary links; in the analysis of communication and socializing structures, it is usually considered appropriate to retain only reciprocated links, and all others are eliminated. This contributes to the reliability of the data; however, this is not a meaningful procedure to use in the analysis of reliance and attributed influence structures for obvious reasons.

There are variations in the techniques which can be used to identify influentials and to analyze subgroup structures. In the first two studies described in this paper, the communication and the socialization matrices were squared and cubed to reveal two- and three-step channels of communication (See Appendix; Figures 1, 2 and 3). Column sums in the cubed matrix represent the total number of three-step communication links between an individual and all other individuals in that matrix; these sums were used to identify influentials. Faculty members were rank-ordered on these column sums, and the upper one-fifth in each school were categorized as influentials while all others were considered to be non-influentials. An examination of the results of this method of categorization in several studies indicated that this arbitrary procedure yielded a reasonable separation between those individuals with a greater and those with fewer communication links in the cubed matrix.

A slightly different method was used for determing the influentials on the reliance dimensions; namely, the subweight substitution method suggested by Blocker and McCabe.[7] Column totals for the first power matrix

were considered to be subweights for each individual. These subweights were then substituted for non-zero elements in the cubed matrix; the columns for this matrix were then summed and each individual's subweight was added to his column total. Members of the faculty were again placed in rank order, and the upper one-fifth classed as influentials. Since the attributed influence data do not lend themselves to expansion in this or a similar manner, the column totals were taken as indicators of the amount of influence attributed to individuals.

One significant outcome of the study of communication and influence structures in schools and school systems is the detection of subgroups or cliques within these units. The progress of empirical research in this area has been handicapped by the relatively slow progress in the development of techniques for accomplishing this task. Various stages in the development of methodology have included the inspection of sociograms, the manipulation of rows and columns in the first power matrix, the manipulation of higher power matrices, and more recently, the factor analysis of sociometric data.[8] The latest developments have greatly increased the feasibility of applying sociometric analysis to the study of large groups and complex organizations. In the studies reported in this paper, the factor analytic procedures developed by Blocker and his associates were extended and applied.[9]

The essential procedure consists of subjecting the inter-correlation matrix derived from the third power communication or socialization matrix to principal axis factor analysis: usually itteration is continued until

eigenvalues as low as 1.000 are reached. Then some critical level of factor loading is accepted as a criterion of group membership. Experience has shown that this value may be in the region of .50 or .40 on the varimax rotation to yield appropriate results (See Appendix; Figure 4 and Table 1). The experience of researchers has been that the factor analytic procedures consistently yield results which compare meaningfully with independently prepared sociograms; this has proven to be extremely useful in the analysis of larger groups where sociograms are difficult to prepare.

Results of Descriptive Studies

An initial study in the sequence to be described was initiated by Miklos and was carried out with the assistance of Bezeau and Breitkreuz.[10] This study was designed to determine the characteristics of the communication and influence structures in a sample of eighteen schools ranging in size from fourteen to thirty-three faculty members and including a variety of grade ranges from elementary to senior high schools. No specific hypotheses were tested since the purpose of the study was to obtain some of the descriptive data summarized below.

Characteristics of Influentials. The results of the study showed that influential members of school staffs tended to differ from those classed as non-influentials on a number of characteristics. When compared with non-influentials, the influentials had more years of professional preparation, more years of total and present school experience, taught at higher grade levels, and were more likely to be male than female. These findings show that the bases of influence in these schools were similar to those which might appear in any professionally-staffed organization; namely,

expertise insofar as this might be indicated by preparation, experience, and grade level to which a teacher is assigned. Sex and age may appear significant only because they are related to these other characteristics; however, some cultural factors may also be operative.

An analysis of influence structures by task areas revealed that individuals who were influential in one task area also tended to be influential in others; that is, influentials tended to be generalized influentials. As might be expected, principals and vice-principals were centrally located in all reliance structures; however, they were not so centrally located in other structures. The results suggested that although principals were consistently high in influence on specific, task-related aspects of reliance and communication, they did not always hold the highest rank in the more generalized influence and communication structure. This observation indicates both the influence potential inherent in the position of principalship in these schools and also the possible presence of significant other sources of influence within the school staff.

Subgroup Structure. The identification of subgroups was carried out for two main areas; namely, the general communication structure and the informal socializing structure. The analysis revealed that there was considerable variation from school to school in terms of such characteristics as the number of subgroups, the size of subgroups, and the relationships among subgroups within and across structures. An attempt to present a typology of subgroup structure resulted in the generalization that the

most frequently occurring type of structure consisted of at least two identifiable subgroups with either some or considerable overlap in membership.

The analysis of the number of subgroups in a school revealed that ten of the eighteen schools had two or fewer communication subgroups while only five had two or fewer socializing subgroups; that is, socializing or expressive subgroups tended to be smaller. It was also observed that the socializing structure was more fragmented than was the general task-related communication structure. Further analysis revealed that socializing subgroups tended to be more completely embedded within communication subgroups of the same or larger size than was true for the reverse; communication subgroups tended to extend beyond the boundaries of particular social subgroups. The finding that communication networks for task-related matters included individuals who were excluded from certain social relationships raises some questions about the extent to which the norms of subgroups have the potential of influencing staff members on task-related matters.

Characteristics of Subgroup Members. A further objective of this analysis was to determine whether the members of different subgroups in a particular school differed on selected characteristics. Because of the relatively small number of individuals within subgroups in any one school, statistical tests became almost meaningless and only in isolated cases were statistically significant differences observed. The inspection of the data did suggest certain trends in the average characteristics of members of

different subgroups.

It appeared that female teachers, who also tended to have the higher number of years of teaching experience, a lower number of years of preparation, and were teaching at lower grade levels, tended to form closely interacting groups both on task-related matters and during informal socializing. The younger male staff members who also had more years of professional preparation and who were teaching at higher grade levels also tended to form exclusive subgroups. In some schools, a subgroup composed of older male teachers with about the same length of experience as the female subgroup but with more years of preparation formed a third type of subgroup. The majority of subgroups could be placed into these three categories without too much distortion; however, there were also substantial numbers of subgroups with unique characteristics.

Conclusion. The results of the analyses described above verify the presence of definable influence and subgroup structures which might be sources of influence upon the behavior of teachers. However, the research provides no evidence that these structures do have any significant impact on teacher behavior. It is still not known whether those staff members classed as influentials actually exert any significant influence or whether subgroup membership makes any difference. These questions were considered in subsequent studies by other investigators.

Influence Structure and Innovation.

Wiens used procedures similar to those described above to investigate the relationship between the attitudes of influential members of teaching staffs and the level of innovativeness in schools.[11] He hypothesized that

the amount of innovation which takes place in schools would be positively related to the attitudes with respect to change held by influentials in those schools. This hypothesis is based on assumptions about the change process which are counter to those basic to "great man" approaches and gives greater attention to the importance of the state of the system and the significance of opinion leaders in the change process following theorizing by Miles and Rogers.[12]

The sample for this study was composed of city schools which enrolled pupils in grades one through nine and which ranged in staff size from twelve to thirty-three teachers. In order to test his hypothesis, Wiens developed an appropriate Likert-type scale for determining the attitudes toward change held by members of the teaching staff and also a questionnaire designed to obtain information on the extent of innovative practices such as the use of educational television, the use of consultant services, participation in team teaching, and so forth.[13]

The analysis was carried out using multiple regression techniques for determining the relationship between the attitudes toward change held by various categories of influentials and the index of school innovativeness. Two of the analyses which were reported are of particular interest; in one of these the principal was included as an influential by virtue of his position while in the other he was excluded even if he qualified as an influential in terms of the sociometric analysis.

The main hypothesis was supported by the results; the attitude toward change held by the influentials was positively and significantly related to

the general level of school innovativeness. The correlation between the two variables was approximately 0.50. Of specific interest to the researcher was the observation that the attitude of the principal was not significantly correlated with the level of innovativeness. When principals were classed as influentials, the relationship between attitudes of influentials and innovativeness was as reported above; however, a somewhat better prediction of school innovativeness (correlation of 0.60) was obtained when the principals were not included as influentials.

Although the difference between these observations is small and the interpretation of the overall relationships is not unequivocal, at least there is support for the possible significant influence of members of teaching staffs on the adoption and maintenance of innovative practices by teachers. Further analysis carried out by Wiens suggests that the vice-principal may be a significant source of influence even though his formal position in these schools is vague and his duties ill-defined.[14]

Subgroup Structure and Teacher Behavior.

The possible impact of selected elements of the social structure of a school staff on the professional role orientation of members of the teaching staff was investigated by Scharf.[15] The sample for the study included twenty-five schools which ranged in size from fifteen to forty-three staff members.[16]

Scharf based his study on Homans' exchange theory; he hypothesized that there would be a positive relationship between teacher professionalism, or more specifically values associated with professional role orientations,

and social structure components such as rates of interaction, technical and social esteem, and subgroup membership categories. He developed appropriate sociometric instruments which differed from those described earlier but used similar analytic techniques. Professional role orientations were determined for staff members along a number of dimensions; beliefs about the significance of knowledge and skill; beliefs about service in teaching; and beliefs about colleague relationships, clients, autonomy, and the professional organization.[17]

The results of the analysis did not support the hypotheses; role orientations were not related to any of the social structure variables. In only one school did Scharf observe significant differences between members of different subgroups on professional role orientations. Consequently, there is little support for the theorizing that school social structure has an impact on (bears a significant relationship to) the behavior of teachers. Even though the study did not support the hypothesis, this hypothesis should be pursued further before it is abandoned for several reasons.

Perhaps future studies might give greater attention to the complexity of the social structure of schools because there may be important differences between task related and non-task related structures as was suggested previously. The selection of appropriate structural elements may yield support for the relationship in future research. Furthermore, the selection of a more appropriate operational definition of the norms and values associated with group membership might also be important. Scharf may well have been

focusing on values and orientations which are either held generally or are not susceptible to group influence, while others more specific to a school might well be so influenced. Finally, the problem of working with small samples may render reliance on statistical techniques largely inappropriate; newer techniques may have to be developed.

Before attempting to assess in greater detail the significance and implications of these studies of social structure, a different conceptual approach and the results of empirical studies based on this approach will be examined. These studies are based on the bureaucratic model. The transition from an examination of social structure to the examination of bureaucratic structure can be made conceptually by referring to Bidwell's observation to the effect that there may be an inverse relationship between the extent to which control on teacher behavior emanates from these two sources.[18] If this does in fact describe reality, then some insights into the possible impact of one structural source can be obtained from the analysis of other possible sources of influence and control.

Analysis of Bureaucratic Structure

Recent attempts to assess the possible impact of the more formalized patterns of operations in schools and school systems upon the behavior of their members have relied heavily upon the analysis of bureaucratic structural characteristics. Most of the research described below originated with the work of Hall who developed an instrument to measure the extent to which bureaucratic features were present in various organizations.[19] This instrument was adapted for use in schools by MacKay and further refined in subsequent studies.[20]

Hall's instrument focused on six fundamental bureaucratic characteristics for which he found support in the literature: hierarchy of authority, specialization, rules for incumbents, procedural specifications, impersonality, and technical competence. The basic conceptual problem with which researchers have been forced to cope is whether bureaucracy should be treated as a unitary concept, whether it is meaningful to treat this as a single dimension, or whether the various bureaucratic characteristics should be investigated separately because of the absence of strong relationships among them. Since the initial and subsequent research was based on dimensional approaches in the form of separate scales for different aspects of bureaucracy, the appropriateness of a dimensional as opposed to a unitary concept lent itself to empirical investigation. Some of the initial results appeared to justify summing all measures to form a global index of degree of bureaucratization; however, there emerged also sufficient statistical evidence to suggest that this procedure might not be entirely justifiable. The possibility of limited or even negative relationships among some of the "dimensions" emerged fairly consistently throughout the various research projects.

A factor analytic study of the dimensions which was carried out by Punch revealed that hierarchy of authority, rules for incumbents, procedural specification, and impersonality tended to vary closely together as did specialization and technical competence.[21] The two clusters appeared fairly independent of each other; the first factor is more highly significant in terms of the total proportion of variance accounted for. Similar

results were obtained by Kolesar.[22] This evidence suggests the possibility of adopting a number of research strategies each of which has conceptual support: scores on six or more dimensions might be used independently, the minor factor might be ignored and research conducted using the single factor of bureaucratization, or the two main dimensions might be used to create a typology of bureaucratic structures. Research carried out to date includes examples of all three possibilities.

Bureaucratic Structure and Student Attitudes

Although the first study to be described does not bear directly upon the attitudes or behavior of teachers, it does present a useful approach to the analysis of structure and indirectly raises some questions about the possible impact of structure on teacher behavior.[23] Kolesar based his research on the general theorizing that client alienation is one of the dysfunctional outcomes of the operation of particular forms of bureaucratic structure. Consequently, he hypothesized that the degree of student alienation will vary in some direct relationship to degree and type of bureaucratization. The hypothesis was tested in a sample of twelve secondary schools.

The bureaucratic structure of the school was conceptualized and defined in terms of two major orthogonal dimensions: an authority dimension and an expertise dimension. Schools in the study were categorized on the basis of degree of emphasis placed on each of these dimensions in their control and operational patterns. Relying on terminology from Weber and Gouldner, Kolesar identified schools which placed high emphasis on both dimensions as monocratic, those which placed high emphasis on expertise but low emphasis on authority were termed collegial, while those with

the reverse emphasis were termed punishment-centered. Schools which placed low emphasis on both dimensions were classed as mock bureaucracies.

On the basis of the discriminating criteria selected, Kolesar was able to class one school in his sample as monocratic, two as collegial, and two as punishment-centered. The remaining schools tended to be like the latter two with a tendency toward punishment-centered characteristics; no schools were classed as mock bureaucracies. The larger schools varied more in structure than did smaller schools; larger schools tended to be more like the collegial or representative type than like any other.

Kolesar relied upon the work of Seeman to a considerable extent for conceptual material on alienation.[24] Student alienation was assumed to be multidimensional; scales were constructed to measure alienation along dimensions of powerlessness, self-estrangement, normlessness, meaninglessness and isolation. Each of these was defined specifically; for example, pupil powerlessness was defined as the expectancy held by the individual that his own behavior cannot determine the occurrence of outcomes or reinforcements he seeks.

Analyses were carried out to test the hypotheses that alienation scores on each dimension and on the total scale would be higher in monocratic and in punishment-centered organizations than in the collegial type. This hypothesis was partially supported in large schools; pupil powerlessness and total scale scores were found to be significantly higher in monocratic types as predicted. Few differences were observed for smaller schools, perhaps due in part to the limited degree of structural variation.

One generalization which emerged from all of the analyses performed

was that significantly high pupil powerlessness and total alienation scores were consistently observed for schools in which scores on the bureaucratic dimension of authority were high. Furthermore, significantly low powerlessness and total scale scores were observed for schools in which scores on the authority dimension were low while those on expertise were high. Thus, there was partial support for the hypothesis. These tendencies seem to demand both additional conceptual clarification and empirical investigation. Among the questions requiring further research are those concerning the intervening variables which may explain the relationship between school structural variables and student attitudes, if this does exist, and also the possible relationship of these same structural variables to teacher attitudes and behavior.

Bureaucratic Structure and Role Orientation

Organizational structure-teacher behavior relationships were approximated more closely in a study completed recently by Eddy; to be more specific, he investigated relationships between perceptions of and reactions to bureaucratic structural characteristics held by teachers with differing role orientations.[25] The sample consisted of more than three hundred teachers located in twenty schools which included grades one to eleven or twelve and which ranged in size from seven to thirty-one staff members. Ten schools were categorized as relatively high and ten as relatively low in bureaucratic characteristics on the basis of responses given by superintendents to an instrument designed for the purpose of obtaining data for this categorization. An attempt was made to control for school district and rating differences by selecting two schools, one in

each category, from each of ten different school systems.

Although Eddy relied on the same conceptual basis for his work as did the other investigators mentioned above, he adopted a different operational definition and specific conceptualization of bureaucratization in schools. Schools were assumed to vary in structural characteristics along a single dimension of bureaucratization composed of the six major features mentioned above. An instrument similar to that used by Moeller was constructed for the purpose of obtaining data on teacher perceptions of and reactions to structural characteristics.[26] A sixteen-item scale was constructed for measuring role orientation along a local-cosmopolitan continuum; the basic source of conceptualizations for the scale was provided by Gouldner.[27]

A number of hypotheses were tested through the application of multiple linear regression models; only those results of specific interest will be mentioned here. It had been hypothesized that teacher perceptions of organizational structure would be related to the high-low bureaucratic categories in which schools were placed; that is, that teachers would perceive higher levels of bureaucratization in schools which had been categorized as relatively high in bureaucratic characteristics on the basis of superintendents' descriptions. Although there was considerable variation in teacher responses, the hypothesis was supported by statistically significant differences. This observation is of methodological interest because it is one of the few times that a researcher has used two independent means to assess bureaucratic characteristics. Of additional interest is the evidence that teachers are sufficiently aware of structural characteristics for differences to appear in questionnaire responses. It

is still a moot question, however, whether more significant aspects of teacher behavior are influenced by the organizational structure.

The only attempt by Eddy to assess the relative desirability of higher and lower degrees of bureaucratization took the form of obtaining data on the degree of satisfaction expressed by teachers with the organizational structure of their schools. The results showed that teachers expressed significantly higher levels of satisfaction with the organizational structure of the more bureaucratic schools; this finding is similar to that reported by other investigators.[28] While this was the result observed for the total sample, it was also found that teachers who tended toward a local orientation expressed higher levels of satisfaction with structure than did those who tended more toward a cosmopolitan orientation. This supports speculation that organizational structure, if it is related to teacher behavior, may be related differentially or in different degrees depending upon teacher characteristics which are yet not identified completely.

If satisfaction with structure can be taken as any indication of desirability, it would appear that higher degrees are preferable to the lower degrees of bureaucratization. Even when we restrict the criterion to teacher satisfaction, it is immediately apparent that the relationships must be more complex than might be assumed. Conceptually and logically it would seem that this relationship, if one exists, should be curvilinear; no analysis based on assumptions of curvilinearity has been reported.

Perhaps this is not too important because the range of bureaucratic characteristics in schools may be so narrow that it is still appropriate to assume linearity; we may have few if any schools in which the degree of bureaucratization is so extreme that noticeable differences in such criteria as teacher satisfaction would appear in a curvilinear fashion. Of course, this does lend itself to the empirical investigation which should be forthcoming if we continue to assume that organizational structure is related to important aspects of teacher and pupil behavior.

Conclusions and Implications

The studies discussed in this paper represent significant advances in attacking the basic conceptual and methodological problems which confront the researcher who wishes to analyze the possible and actual impact of organizational structure on the behavior of members of the organization. In addition to serving as tools for researchers, these advances also provide potentially useful concepts and viewpoints for practicing administrators. These insights may prove to be of greater immediate value than the empirical results of any research undertaking; the promise of future research offers little relief from the pressures for immediate action.

Studies of school social structures have given some support to the views that members of teaching staffs may have a greater influence in determining what takes place in schools than is frequently assumed. This raises questions both about the desirability of increasing this source of influence and of the structural changes which would facilitate the increased exercise of this influence. It also raises organizational problems related

to monitoring the effects of this source of influence. Some of the techniques which have been developed for the study of social structures may aid practicing administrators in the casual observation and analysis of particular structures; they may also prove useful in attempts to modify structure or to induce other changes.

The conceptualizations of bureaucratic structure and its major dimensions immediately raises questions about the extent to which each of these should be or needs to be emphasized. Clearly, it is not so much a matter of deciding whether these formal elements are required as it is of deciding to what degree should they be present and how should they be manifested. Bureaucratic elements seem to provide some of the predictability which many people desire of the organizations in which they work; however, the optimal degree of this structuring is elusive. Even now the research raises questions about the appropriate linking of authority and expertise in schools and school systems, about the mechanisms which are required and the structural and procedural changes involved in shifting the relative emphasis on these dimensions.

The need for structural changes in the organization of schools and school systems looms as even more significant if we continue to assume some causal relations between structure and the behavior of persons in the organization. Traditionally, the attempts to improve teaching and learning have focused on changing methods, materials, or people; organizational change followed slowly and at times accidentally. Perhaps we need to give much more attention to making the structural changes demanded by the nature of the processes within the organization and perhaps even resorting to structural modifications to force other changes within the system.[29] In the

absence of firm research evidence, the practitioner is placed in the role of an experimenter with the structure of the organization; he introduces modifications and attempts to monitor results. If this role is too threatening he may well find some willing assistance from researchers who would be pleased to have greater variation in practices which they could try to assess.

This is not to say that researchers have exhausted the present research possibilities; nevertheless, limited variation in practice will continue to be a source of difficulty in researching this area. Further challenges are provided by the need to develop improved conceptualization in such areas as the dimensions of bureaucratic structure or, more generally, of organizational structure. There is no need to rely exclusively on the concepts related to bureaucracy merely because of their revered status.[30] Researchers might well look to other conceptualizations, but what is potentially even more useful would be to develop conceptualizations which are of particular relevance to schools and school systems.

Similar observations can be made about the conceptualization required for the more thorough and more useful analysis of the social structures of schools. The analysis of organizational structure-individual member relationships calls for a thorough search for all possible sources of impact within the structure as well as for significant variables which mediate or are affected by the structure.[31] This clearly indicates the need for much more extensive study, but also for more sensitized monitoring by administrators of organizational structure, and greater cooperation by researchers and

practitioners in clinical approaches to the analysis and modification of organizational structure. Hopefully, these strategies may prove to be useful in designing structures which are more adequate than those we have now to the demands of current and future educational practices.

NOTES AND REFERENCES

1) One recent example of this line of inquiry is reported in: Christopher W. Flizak, "Organizational Structure and Teacher Role-Orientation", Administrator's Notebook, XVII, No. 2 (October, 1968).

2) Alvin W. Gouldner, "Organizational Analysis", in Robert K. Merton and others, eds., Sociology Today (New York: Basic Books, 1959), pp. 400-428.

3) See for example: Peter M. Blau, Bureaucracy in Modern Society (New York: Random House, 1956), pp. 29-31; and M. Weber, From Max Weber: Essays in Sociology, trans. H. H. Gerth and C. W. Mills (New York: Oxford University Press, 1946).

4) The general approach is clearly presented in Clyde E. Blocker, Robert H. McCabe, and Albert J. Prendergast, A Method for the Sociometric Analysis of the Informal Organization within Large Work Groups (Austin, Texas: The Authors, 1964). The studies described in this paper are indebted to the conceptual and methodological advances presented in the monograph.

5) Although reference is made from time to time in this paper to the "impact of structure on behavior", the writer recognizes that the empirical research which is discussed at best shows a relationship between the variables; it is this writer's terminology and not that of the original researchers. The relationships which are significant support the possibility of a causal relationship but do not confirm it.

6) These procedures for manipulating sociomatrices are described by Blocker and his associates; procedures specific to some of the studies described in this paper are detailed in Elmer A. Breitkreuz, "An Analysis of School Influence and Subgroup Structures" (Master's thesis, The University of Alberta, 1967), pp. 45-80.

7) Clyde E. Blocker and Robert H. McCabe, Relationships Between the Informal Organization and the Curriculum in Six Junior Colleges (Austin, Texas: The Authors, 1964), p. 107.

8) A review of techniques for the analysis of subgroup structures is presented in Murray Glanzer and Robert Glaser, "Techniques for the Study of Group Structure and Behavior: 1. Analysis of Structure", Psychological Bulletin, LVI (September, 1959), pp. 317-332.

9) Blocker, McCabe, and Prendergast, op. cit., pp. 27-29.

10) This study is described in more detail in the following sources: E. Miklos and Elmer A. Breitkreuz, "Analysis of Influence and Social Structures in Schools", Alberta Journal of Educational Research, XIV, (December, 1968), pp. 239-251.; Breitkreuz, Ibid.; and Lawrence M. Bezeau, "The Instrumental-Expressive Dichotomy in School Staffs", (Master's thesis, The University of Alberta, 1966). The results discussed below have been presented, in part, in these sources.

11) John Wiens, "Attitudes, Influence and Innovativeness: An Analysis of Factors Related to Innovativeness in Educational Organizations" (Doctoral thesis, The University of Alberta, 1968).

12) Mathew B. Miles, "Planned Change and Organizational Health: Figure and Ground", in Richard O. Carlson and others, Change Processes in the Public Schools (Eugene: Center for the Advanced Study of Educational Administration, University of Oregon, 1965), pp. 11-34; and Everett M. Rogers, Diffusion of Innovations (New York: The Free Press of Glencoe, 1962).

13) The study was described and the results summarized in a paper entitled "Influence Structure and Innovations" which was presented by John Wiens to the Annual Meeting of the American Educational Research Association in Chicago, February 9, 1968.

14) Personal communication from John Wiens, December 1968.

15) Murray P. Scharf, "An Investigation of the Relationship Between the Professional Role-Orientation and the Social Structure of Teacher Groups" (Doctoral thesis, The University of Alberta, 1968).

16) The study is described in more detail and is summarized in a paper entitled "Professional Role Orientation and the Social Structure of Teacher Groups" which was presented by Murray Scharf to the Annual Meeting of the American Educational Research Association in Chicago, February 9, 1968.

17) The adaptation and development of the scales is discussed in Nicholas P. Hrynyk, "Correlates of Professional Role Orientation in Teaching" (Doctoral thesis, The University of Alberta, 1966).

18) See Charles E. Bidwell, "The School as a Formal Organization", in James G. March, ed., Handbook of Organizations (Chicago: Rand McNally and Company, 1965), pp. 972-1022.

19) Richard H. Hall, "The Concept of Bureaucracy: An Empirical Assessment", American Journal of Sociology LXVI (July, 1963), pp. 32-40; and more recently Richard H. Hall, "Professionalization and Bureaucratization", American Sociological Review, XXXIII (February, 1968), pp. 92-104.

20) The adaptation and modification of the Hall instrument are described in D. A. MacKay, "An Empirical Study of Bureaucratic Dimensions and their Relation to Other Characteristics of School Organizations" (Doctoral Thesis, The University of Alberta, 1964). Further developments were described by MacKay in a paper entitled "Research on Bureaucracy in Schools: The Unfolding of a Strategy", presented to the Annual Meeting of the Educational Research Association in Chicago, February 9, 1968; a revision of this paper will appear in a forthcoming number of The Journal of Educational Administration.

21) Keith F. Punch, "Bureaucratic Structure in Schools: Toward Redefinition and Measurement" (Mimeographed); see also Keith F. Punch, "Bureaucratic Structure in Schools and its Relationship to Leader Behavior: An Empirical Study" (Doctoral thesis, The University of Toronto, 1967).

22) Henry Kolesar, "An Empirical Study of Client Alienation in the Bureaucratic Organization" (Doctoral thesis, The University of Alberta, 1967).

23) The results of the study are summarized in a paper entitled "Bureaucratic Organizational Structure and Student Alienation" which was presented by Henry Kolesar at the Annual Meeting of the American Educational Research Association in Chicago, February 9, 1968).

24) Melvin Seeman, "On the Meaning of Alienation", American Sociological Review, XXIV (December, 1959), 783-791.

25) Wesley P. Eddy, "The Relationship of Local-Cosmopolitan Role Orientation to Organizational Characteristics of Schools", (Doctoral thesis, The University of Alberta, 1968).

26) Gerald M. Moeller, "Bureaucracy and Teachers' Sense of Power", Administrator's Notebook, XI (November, 1962); see also Gerald M. Moeller and W. W. Charters, "Relation of Bureaucratization to Sense of Power Among Teachers", Administrative Science Quarterly,X (March, 1966), pp. 444-465.

27) Alvin W. Gouldner, "Cosmopolitans and Locals: Toward an Analysis of Latent Social Role", Administrative Science Quarterly, II (December, 1957), pp. 281-306 and II (March, 1958), pp. 444-480.

28) See for example: MacKay, "An Empirical Study of Bureaucratic Dimensions ....," ibid.

29) This writer does not share completely the somewhat pessimistic view of the usefulness of the organizational structure concept presented by Melvyn Paul Robbins and Jean Russell Miller, "The Concept School Structure: An Inquiry Into Its Validity", Educational Administration Quarterly, V (Winter, 1969), pp. 37-49; however, he does agree with the need for improved conceptual development and broader criteria for the assessment of structure.

30) Other writers have suggested related but also different approaches to the analysis of structure; see for example: D. S. Pugh and others, "Dimensions of Organization Structure", Administrative Science Quarterly, XIII (June, 1968), pp. 65-105.

31) The analysis of social structure can be extended to units other than the school. See for example: Stewart W. Martin, "A Political Systems Analysis of an Urban School Board", (Doctoral thesis, The University of Alberta, 1968).

A P P E N D I X

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1						1										
2																
3									1	1	1					
4																
5																
6	1						1	1		1	1				1	
7						1		1								
8						1	1								1	
9			1							1						
10			1			1			1		1					
11			1			1				1						
12																
13																
14																
15						1			1							
16																

Figure 1

Reciprocated Communication Sociomatrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	1						1	1		1	1				1	
2																
3			3			2			1	2	1					
4																
5																
6			2			6	1	2	1	1	1				1	
7	1					1	2	1		1	1				2	
8	1					2	1	3		1	1				1	
9			1			1			2	1	2					
10	1		2			1	1	1	1	4	2				1	
11	1		1			1	1	1	2	2	3				1	
12																
13																
14																
15	1					1	2	1		1	1				2	
16																

Figure 2

Second Power Communication Matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1			2			6	1	2	1	1	1				1	
2																
3	2		4			3	2	2	5	7	7				2	
4																
5																
6	6		3			6	8	8	3	10	9				8	
7	1		2			8	2	5	1	2	2				2	
8	2		2			8	5	4	1	3	3				5	
9	1		5			3	1	1	2	6	3				1	
10	1		7			10	2	3	6	6	7				2	
11	1		7			9	2	3	3	7	4				2	
12																
13																
14																
15	1		2			8	2	5	1	2	2				2	
16																

Figure 3

Third Power Communication Matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	4		2			9	4	5	1	4	4				4	
2		1														
3	2		14			9	2	2	11	16	13				2	
4				1												
5					1											
6	9		9			25	14	17	6	16	15				14	
7	4		2			14	9	11	1	5	5				8	
8	5		2			17	11	14	1	6	6				11	
9	1		11			6	1	1	9	12	9				1	
10	4		16			16	5	6	12	19	16				5	
11	4		13			15	5	6	9	16	14				5	
12												1				
13													1			
14														1		
15	4		2			14	8	11	1	5	5				9	
16																

Figure 4

Third Power Communication Matrix Adjusted for Factor Analysis

Table I

Factor Analysis Results for Figure 4

Test Number (Person)	Communalities	Factor I	Factor II	Factor III
1	0.965	0.922	0.333	0.057
2	0.322	-0.171	-0.156	-0.518
3	0.999	0.130	0.990	0.050
4	0.268	-0.174	-0.158	-0.461
5	0.200	-0.178	-0.162	-0.376
6	0.997	0.881	0.466	0.061
7	0.994	0.985	0.145	0.051
8	0.995	0.990	0.112	0.050
9	0.997	0.057	0.996	0.047
10	0.998	0.366	0.928	0.058
11	0.994	0.450	0.888	0.060
12	0.097	-0.202	-0.186	0.149
13	0.181	-0.209	-0.193	0.317
14	0.160	-0.208	-0.192	0.283
15	0.994	0.985	0.145	0.051
16	0.328	-0.217	-0.201	0.490
Eigenvalues		5.171	4.227	1.091